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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/017,186	12/07/2001	Sadeg M. Faris	Reveo-0153USAOON00	6324
7590 05/05/2004			EXAMINER	
Ralph J. Crispino			CHIN, PAUL T	
Reveo, Inc.			ART UNIT	
85 Executive Blvd.			PAPER NUMBER	
Elmsford, NY 10523			3652	

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Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/017,186	Applicant(s) FARIS, SADEG M.	
	Examiner PAUL T. CHIN	Art Unit 3652	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 24 February 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-9 and 16-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-9 and 16-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |                                                                                                                        |                                                                                         |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                                                       | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____                                                |

### **DETAILED ACTION**

1. The amendment filed February 24, 2004, and the arguments presented therewith have been carefully considered. Due to the newly claim rejection under 35 USC 112 and new applied prior art, a non-final office action follows as below. The prior art, Bhandarkar et al. (5,967,577) and Nagoaka (6,336,492), are still applied in the claim rejection.

#### ***Specification***

2. The title of the invention is not descriptive. Changing the title "Device for handling fragile objects" is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed. For example, "Vacuum Holding Device For Handling Fragile Objects" may be a good title or other more descriptive title.

#### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 8 and 9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claimed languages of "*metals, alloys, semiconductor materials, and ceramics*," (claim 8) are not clearly understood. For example, the claimed material "metals" is vague and indefinite because there are several "metals" such as stainless steel, aluminum, steel, and other metals. Moreover, the claimed language of "semiconductor materials" is also vague and indefinite as to whether the "materials" refer to "plastic" "metal" "aluminum" is unclear. Further, claim 9 is vague and infinite. It is unclear as to whether the handler

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device” or “the gripped object is being made of “semiconductor material.” Even if the “gripped object” is made of semiconductor material, it is still confusing as to whether applicant is claiming the intended use of gripping an object made of a semiconductor material or claiming the device in combination with the gripped object made of semiconductor material.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1,2,4-6,8, and 16, as best understood, are rejected under 35 U.S.C. 102(b) as being clearly anticipated by **Bhandarkar et al. (5,967,577)**.

**Bhandarkar et al. (5,967,577)** discloses a handler for applying vacuum holding force to an object, comprising a body (Fig. 3) having a plurality of openings including a holding surface level and a suction level, wherein the openings (54,54) at the suction level are larger than the openings (42,42) at the holding level, and further wherein the openings at the suction surface level are in fluid communication with at least a portion of the openings at the holding surface level.

Re claim 2, Bhandarkar et al.' handler (5,967,577) shows that the numbers of the openings (42,42) at the holding surface is greater than the numbers of the openings (54,54) at the suction surface level.

Re claims 4-6, Bhandarkar et al.' handler (5,967,577) further shows at least one intermediate level between the holding surface and the suction surface levels wherein the openings (50,50, or 52,52) of the intermediate level are larger than the openings (42,42) of the holding surface level and smaller than the openings (54,54) of the suction surface level. Similarly, the numbers of the openings (50,50, or 52,52) at the intermediate level is greater than the numbers of the openings at the suction surface level.

Re claim 8, Bhandarkar et al.' handler (5,967,577), as best understood, shows the walls and baffles are formed of metal, aluminum (see Col 4, lines 29-35).

Re claim 16, further shows a handler body having a thickness (see Fig. 3) and a vacuum source (74). It is pointed out that Bhandarkar et al.' handler (5,967,577) contains all the structural elements as recited in the above claims while the intended use or the functional limitation (i.e. *suitable for holding fragile objects*) is not patentably significant.

7. Claims 1,2,4-8, and 16, as best understood, are rejected under 35 U.S.C. 102(e) as being clearly anticipated by **Nagoaka (6,336,492)**.

**Nagoaka (6,336,492)** discloses a handler for applying vacuum holding force to an object, comprising a body (Fig. 5) having a plurality of openings (27,25,10a) including a holding surface level and a suction level, wherein the openings ((27), (25,25), or openings on the plate (28)) at the suction level are larger than the openings (10a,10a) at the holding level, and further wherein

the openings at the suction surface level are in fluid communication with at least a portion of the openings at the holding surface level.

Re claim 2, Nagoaka's handler (6,336,492) shows that the numbers of the openings (10a,10a) at the holding surface is greater than the numbers of the openings ((25,25), or openings on the plate (28)) at the suction surface level.

Re claims 4-6, Nagoaka's handler (6,336,492) further shows at least one intermediate level between the holding surface and the suction surface levels wherein the openings (25,25) of the intermediate level are larger than the openings (10a,10a) of the holding surface level and smaller than the openings [(located on the plate 28) (see Fig. 5)] of the suction surface level. Similarly, the numbers of the openings (25,25) at the intermediate level is greater than the numbers of the openings [(located on the plate 28) (see Fig. 5)] at the suction surface level.

Re claim 7, Nagoaka's handler (6,336,492) further shows a valve (29) (see Fig. 5) in the one opening [(27) or (one of the openings at plate 28)] of the openings to control the fluid flow.

Re claim 8, Nagoaka's handler (6,336,492), as best understood, shows the central chamber (12) is being made of metal (see Col 5, lines 18-29).

Re claim 16, Nagoaka's handler (6,336,492) further shows a handler body having a thickness (see Fig. 5) and a vacuum source (Fig. 3).

8. Claims 1,4,6,8, and 16, as best understood, are rejected under 35 U.S.C. 102(b) as being clearly anticipated by **Lovegrove (2,572,640)** (see PTO-892, paper No. 4).

**Lovegrove (2,572,640)** discloses a handler for applying vacuum holding force to a fragile object (19), comprising a body (Fig. 2) having a plurality of openings including a holding surface

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level and a suction level, wherein the openings (22,22 or 24,24) at the suction level are larger than the openings (18,18, or 14,14, or 22,22) at the holding level, and further wherein the openings at the suction surface level are in fluid communication with at least a portion of the openings at the holding surface level.

Re claim 2, Lovegrove (2,572,640) shows that the numbers of the openings (14,14 or 18,18) at the holding surface is greater than the numbers of the openings (22,22), or openings on the plate (20,23) at the suction surface level.

Re claims 4-6 and 16, Lovegrove's handling device (2,572,640) further shows at least one intermediate level (20) between the holding surface and the suction surface levels wherein the openings (22,22) (see Fig. 1) of the intermediate level are larger than the openings (24,24) (Fig. 1) of the holding surface level and smaller than the openings (14,14, or 18,18) of the suction surface level. Similarly, the frequency of the openings (22,22) at the intermediate level is greater than the numbers of the openings (24,24) at the suction surface level.

Re claim 8, Lovegrove's handling device (2,572,640), as best understood, is being made of lightweight metal (Col 1, lines 22-32).

***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Bhandarkar et al.** handler (5,967,577) in view of **Tsuji** (5,564,682).

Bhandarkar et al.' handler (5,967,577), as presented in section 6 above, does not clearly show *at least one micro-mechanical valve* in the at least one of the openings.

However, **Tsuji (5,564,682)** shows a wafer chuck *having a plurality of wafer ports or openings* (23,30) (Fig. 6) wherein *at least one mechanical valve* (31,32) is provided on at least one of the vacuum ports or openings (30,30) to control the fluid flow. Accordingly, it would have been an obvious to one of the ordinary skill in the art at the time the invention was made to provide *a mechanical valve or a micro-mechanical valve* on the at least one of the openings of Bhandarkar et al.' handler (5,967,577) as taught by Tsuji (5,564,682) in order to manageably control the fluid flow.

11. Claim 9, as best understood, is rejected under 35 U.S.C. 103(a) as being unpatentable over **Bhandarkar et al.' handler (5,967,577)** in view of **Patel et al. (6,139,079)** (see PTO-892).

**Bhandarkar et al.' handler (5,967,577)**, as presented in section 6 above, is used to pick up solder balls, but does not show the object picked up is being made of *a semiconductor material* (from the group consisting of silicon, III-V type semiconductors, II-IV type semiconductors, II-VI type semiconductor, IV-VI type semiconductors, Ge, C, Si-oxide, Si-nitride, and at least one of the foregoing materials).

However, **Patel et al. device (6,139,079)** shows a vacuum suction device picking up solder balls (Fig. 2) and also to grip a substrate or a wafer (44) (see Fig. 8) (Col 7, lines 61-66). Accordingly, it would have been an obvious to one of the ordinary skill in the art at the time the invention was made to pick up a well-known wafer the *material made of silicon on the*



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**Bhandarkar et al.' handler (5,967,577)** as taught by Patel et al. device (6,139,079) in order to use the device not only to pick up solder balls but also to grip a substrate.

12. Claim 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Bhandarkar et al.' handler (5,967,577)**.

Bhandarkar et al.' handler (5,967,577), as presented in section 6 above, does not clearly show that *the ratio of the handler body thickness (Fig. 3) to the holding surface hole diameter (42) is about  $10^7$  to about  $10^2$ , or  $10^6$  to about  $10^3$ , or  $10^5$  to about  $10^4$* . However, it would have been an obvious design choice to those skilled in the art to provide *the desired ratio* as listed above on the Bhandarkar et al.' handler (5,967,577) in order to manageably control the desired fluid flow.

13. Claims 9 and 17-19, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over **Nagoaka's handler (6,336,492) or Lovegrove (2,572,640)**.

Re claim 9, Nagoaka's handler (6,336,492), as presented in section 7 above, does not clearly show *a semiconductor material* (from the group consisting of silicon, III-V type semiconductors, II-IV type semiconductors, II-VI type semiconductor, IV-VI type semiconductors, Ge, C, Si-oxide, Si-nitride, and at least one of the foregoing materials).

**Lovegrove's device (2,572,640)**, as presented in section 8 above, is intended to grip a film or a thin paper or metal sheets (Col 1, lines 1-8), but it does not show the gripped sheet is made of *a semiconductor material as listed above*.

However, it would have been an obvious design choice to those skilled in the art to provide *material selections of the handler and semiconductor* listed above, which are well-known in the art, on the Nagoaka's handler (6,336,492) or Lovegrove's device (2,572,640), in order to grip an object made of one of the semiconductor materials listed above.

Re claims 17-19, Nagoaka's handler (6,336,492) or Lovegrove (2,572,640), still does not clearly show that *the ratio of the handler body thickness (Fig. 3) to holding surface hole diameter (42) is about  $10^7$  to about  $10^2$ , or  $10^6$  to about  $10^3$ , or  $10^5$  to about  $10^4$ .* However, it would have been an obvious design choice to those skilled in the art to provide *the desired ratio* as listed above on the Nagoaka's handler (6,336,492) or Lovegrove (2,572,640), in order to manageably control the flow of the fluid.

#### ***Response to Arguments***

14. Applicant's arguments filed February 24, 2004, have been fully considered but they are not persuasive.

#### **Bhandarkar's device**

Applicant argues on page 8 that "*Bhandarkar is directed to a dispenser used for dispensing fluids, There is no teaching or suggestion in Bhandarker to use a vacuum holding force or even mention of a vacuum handling fragile material.*" The argument is not persuasive. Bhandarkar's device is used to pick up solder balls and is also called a dispenser for providing homogeneous flow of fluid through the outlet ports (see abstract). It is noted that the word "fluid" can be defined as "a continuous, amorphous substance whose molecules move freely past one another and that has the tendency to assume the shape of its container; a liquid or gas" according to The American Heritage® Dictionary

of the English Language, Third Edition. In other word, "air" is also called "fluid" in mechanical engineering term and the fluid is not necessary to be a liquid as applicant argues. Moreover, Bhandarkar's device also shows that "when a negative pressure is applied, fluid will flow in the opposite direction, namely, out of the chamber (32) and into container" Col 5, lines 13-27) creating a vacuum and providing a vacuum force on the object. Further, it is pointed out that Bhandarkar et al.' handler (5,967,577) contains all the structural elements as recited in the above claims while the intended use or the functional limitation (i.e. *suitable for holding fragile objects*) is not patentably significant.

Moreover, the argument on the combination of Bhandarkar et al.' handler (5,967,577) and Tsuji (5,564,682) is not persuasive. Tsuji (5,564,682) shows a wafer chuck *having a plurality of wafer ports or openings* (23,30) (Fig. 6) wherein *at least one mechanical valve* (31,32) is provided on at least one of the vacuum ports or openings (30,30) to control the fluid flow. Accordingly, it would have been an obvious to one of the ordinary skill in the art at the time the invention was made to provide *a mechanical valve or a micro-mechanical valve* on the at least one of the openings of Bhandarkar et al.' handler (5,967,577) as taught by Tsuji (5,564,682) in order to manageably control the fluid flow. Providing a valve on the passageway of vacuum port to close or open is well known in the art in the semiconductor industries to control the fluid flow.

**Nagoaka (6,336,492)**

The arguments on Nagoaka (6,336,492) are also not persuasive.

Nagoaka (6,336,492) discloses a handler for applying vacuum holding force to an object, comprising a body (Fig. 5) having a plurality of openings (27,25,10a) including a holding surface level and a suction level, wherein the openings ((27), (25,25), or openings on the plate (28)) at the suction level are larger than the openings (10a,10a) at the holding level, and further wherein the openings at the suction surface level are in fluid communication with at least a portion of the openings at the holding surface level. Therefore, Nagoaka's device (6,336,492) contains all the structural elements *as broadly as recited* in the above claims 1,2,4-9, and 16-19.

### ***Conclusion***

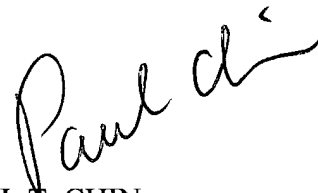
15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PAUL T. CHIN whose telephone number is (703) 305-1524. The examiner can normally be reached on MON-THURS (7:30 -6:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, EILEEN LILLIS can be reached on (703) 308-3248. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read "Paul T. Chin", is written above the printed name.

PAUL T. CHIN  
Examiner  
Art Unit 3652